

Serial No. 10/064,939
Docket No. 13DV-13676

Amendments to the Claims:

Please rewrite claims 1-3, 6, 10, 16 and 19 and cancel claims 4, 5, 8, 9, 20, 22, 25 and 26 without prejudice to Applicants.²

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Claim 1 (Amended): A component comprising an outer coating having a cubic microstructure and consisting essentially of either a zirconia-based composition or a hafnia-based composition, the zirconia-based composition consisting essentially of zirconia and a stabilizer chosen from the group consisting of stabilized with dysprosia, erbia, neodymia, and samarium oxide, or yttria, or zirconia stabilized with gadolinium oxide and yttria, or the hafnia-based composition consisting essentially of hafnia and at least one stabilizer chosen from the group consisting of stabilized with dysprosia, gadolinium oxide, samarium oxide, yttria and or ytterbia.

Claim 2 (Amended): A component according to claim 1, wherein the outer coating consists essentially of one of the zirconia-based compositions zirconia stabilized by about 10 to about 45 atomic percent dysprosia.


² Claim amendments presented herein are in accordance with the "Revised Amendment Format" published in the Official Gazette on February 25, 2003. Strike-throughs indicate deletions and underlining indicates insertions.

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Claim 3 (Amended): A component according to claim 1, wherein the outer coating consists essentially of zirconia stabilized by about 10 to about 25 atomic percent erbia.

Claims 4 and 5 (Cancelled)

Claim 6 (Amended): A component according to claim 1, wherein the outer coating consists essentially of zirconia stabilized by about 8 to about 22 atomic percent neodymia.



Claim 7 (Original): A component according to claim 1, wherein the outer coating consists essentially of zirconia stabilized by about 10 to about 25 atomic percent samarium oxide.

Claims 8 and 9 (Cancelled)


Claim 10 (Amended): A component according to claim 1, wherein the outer coating consists essentially of one of the hafnia-based compositions ~~zirconia-stabilized~~

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~~by about 8 to about 30 atomic percent ytterbia and about 4 to about 5 weight percent~~
~~yttria.~~

Claim 11 (Original): A component according to claim 1, wherein the outer coating consists essentially of hafnia stabilized by about 10 to about 50 atomic percent dysprosia.

Claim 12 (Original): A component according to claim 1, wherein the outer coating consists essentially of hafnia stabilized by about 5 to about 30 atomic percent gadolinium oxide.




Claim 13 (Original): A component according to claim 1, wherein the outer coating consists essentially of hafnia stabilized by about 5 to about 30 atomic percent samarium oxide.

Claim 14 (Original): A component according to claim 1, wherein the outer coating consists essentially of hafnia stabilized by about 10 to about 45 atomic percent yttria.

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Claim 15 (Original): A component according to claim 1, wherein the outer coating consists essentially of hafnia stabilized by about 10 to about 50 atomic percent ytterbia.

Claim 16 (Amended): A component according to claim 1, wherein the outer coating is one of the hafnia-based compositions in which the stabilizer is dysprosia, gadolinium oxide, samarium oxide, or ytterbia. and the outer coating further contains about 4 to about 5 weight percent yttria.



Claim 17 (Original): A component according to claim 1, further comprising a metallic bond coat adhering the outer coating to the component.

Claim 18 (Original): A component according to claim 1, wherein the component is a superalloy airfoil component of a gas turbine engine.

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Claim 19 (Amended): A gas turbine engine component comprising:

a superalloy substrate;

a metallic bond coat on a surface of the substrate; and

a thermal barrier layer as an outermost coating of the component, the thermal barrier layer having columnar grains and a cubic microstructure, the thermal barrier layer consisting essentially of either a stabilized zirconia-based composition or a stabilized hafnia-based composition;

wherein the stabilized zirconia-based composition is chosen from the group consisting of ~~zirconia stabilized with about 10 to about 45 atomic percent dysprosia;~~ zirconia stabilized with about 10 to about 25 atomic percent erbia, ~~zirconia stabilized with about 10 to about 25 atomic percent gadolinium oxide and up to about 5 weight percent yttria;~~ zirconia stabilized with about 8 to about 22 atomic percent neodymia, and zirconia stabilized with about 10 to about 25 atomic percent samarium oxide, ~~zirconia stabilized with about 8 to about 30 atomic percent ytterbia, and zirconia stabilized with about 8 to about 30 atomic percent ytterbia and up to about 5 weight percent yttria; and~~

wherein the stabilized hafnia-based composition is chosen from the group consisting of hafnia stabilized with about 10 to about 50 atomic percent dysprosia, hafnia stabilized with about 5 to about 30 atomic percent gadolinium oxide, hafnia


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stabilized with about 5 to about 30 atomic percent samarium oxide, hafnia stabilized with about 10 to about 45 atomic percent yttria, or hafnia stabilized with about 10 to about 50 atomic percent ytterbia.

Claim 20 (Cancelled)

Claim 21 (Original): A gas turbine engine component according to claim 19, wherein the thermal barrier layer consists of zirconia stabilized by about 12 to about 25 atomic percent erbia.

Claim 22 (Cancelled)



Claim 23 (Original): A gas turbine engine component according to claim 19, wherein the thermal barrier layer consists of zirconia stabilized by about 8 to about 18 atomic percent neodymia.

Claim 24 (Original): A gas turbine engine component according to claim 19, wherein the thermal barrier layer consists of zirconia stabilized by about 10 to about 20

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atomic percent samarium oxide.

Claims 25 and 26 (Cancelled)

Claim 27 (Original): A gas turbine engine component according to claim 19, wherein the thermal barrier layer consists of hafnia stabilized by about 10 to about 45 atomic percent dysprosia.


Claim 28 (Original): A gas turbine engine component according to claim 19, wherein the thermal barrier layer consists of hafnia stabilized by about 10 to about 25 atomic percent gadolinium oxide.

MA (Claim 29 (Original): A gas turbine engine component according to claim 19, wherein the thermal barrier layer consists of hafnia stabilized by about 10 to about 20 atomic percent samarium oxide.

Claim 30 (Original): A gas turbine engine component according to claim 19, wherein the outer coating consists of hafnia stabilized by about 15 to about 40 atomic

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percent yttria.

 Claim 31 (Original): A gas turbine engine component according to claim 19,
wherein the thermal barrier layer consists of hafnia stabilized by about 15 to about 25
atomic percent ytterbia.
